

A Study on Prevalence of Acne Vulgaris and Its Impact on Quality of Life in Adolescents of Kendriya Vidyalaya's of Jalahalli Area of Bangalore

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ABSTRACT

Background and Objective: Acne vulgaris is a chronic condition affecting more than 85% of adolescents and young adults. It is one of the most common diseases affecting humanity and its impact on quality of life (QoL) is important. The interaction of acne and psychosocial issues is complex and, in adolescence, can be associated with developmental issues of body image, socialization and sexuality. Thus, the present study was conducted to assess the prevalence of acne vulgaris, its impact on quality of life and to study socio-demographic factors, family history and lifestyle among the selected schools in Jalahalli area of Bengaluru.

Methods: The present study was descriptive cross sectional school based study conducted in the Jalahalli area of Bengaluru city from January 2017 to December 2017. A total of 200 subjects were included. A predesigned, pretested, structured questionnaire consisting of questions on various aspects regarding socio-demographic profile, assessment of quality of life and symptoms of acne vulgaris were administered to the participants fulfilling inclusion criteria. Data regarding the severity of acne vulgaris and Quality of life status were obtained by using Global Acne Grading System and CADI and CDLQI/DLQI respectively. SPSS 18.0 software was used for data analysis.

Results: Findings of the study revealed that, Acne prevalence was 87% affecting both sexes. Self reported mild acne was present in 85.1% and moderate severe acne in 14.9% of the adolescents. The mean age of the subjects was 14.78 years. 52.5% were females and 47.5% were males. A strong relation was found between the severity of acne and quality of life ($p < 0.001$). Subject with moderate/severe acne experience greater impairment in quality of life ($p < 0.001$). Heredity is correlated with acne and its severity was significant.

Interpretation and Conclusion: Acne affects the quality of life of an adolescent. The impact is proportional to the severity of acne. More severe acne is associated with greater effect on quality of life. The present study reveals that increasing prevalence of Acne vulgaris and poor quality of life among the adolescents. Evaluation of quality of life in such patients may greatly help in the better management of acne, hence improving their quality of life.

Keywords: Acne vulgaris; Adolescent; Quality of life; GAGS; CDLQI/DLQI.

INTRODUCTION

Physical appearance is important in our society and influences the way in which we are perceived by others. The skin is the most visible organ of the body and determines, to a large extent, our appearance with a wide function in social and sexual communication.¹ Acne vulgaris is one of the most common skin disorder.^{2,3} Acne

vulgaris is a common skin disease affecting up to 80% of adolescents and many adults at some stage. It is associated with considerable psychological impairment which is comparable with certain chronic diseases like asthma, epilepsy, diabetes and arthritis.^{2,3} Acne patients are prone to low self esteem, low confidence and social dysfunction which may lead to anxiety,

depression, obsessive compulsive disorder and sometimes suicidal ideation.⁴ Also prevalence of acne in school children reported ranges from 30-100% depending on age.⁵ More severe acne has been suggested to be associated with increased anxiety, depression symptoms and impact on patient life.⁶

The psychosocial affect of acne was first recognized in 1948, when Sulz Barger Zalden mentioned that there is no single disease which causes more psychic trauma and more maladjustment between parents and children more general insecurity and feeling of inferiority and greater sums of psychic assessment than does acne vulgaris. Acne is strongly associated with depression and anxiety.⁷

Quality of life is a general term which includes a feeling of joy and satisfaction with life. WHO defines QOL as the "individuals' perception of their position in the context of culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns."⁴

Acne vulgaris is a chronic inflammatory disease of the pilosebaceous follicles, common in adolescents, characterized by comedones, papules, pustules, cysts, nodules, and occasionally scars.⁹ The term acne is derived from Greek word 'acme' which means 'prime of life'. Although generally considered to be a benign, self limiting condition, acne may cause severe psychological problems or disfiguring scars that can persist for a lifetime.¹⁰

According to *Ibn-Sina*, *Buthure-i-Labaniyya* (acne) are small white eruption on the nose and cheeks which resemble condense drop of milk.¹¹ According to *Qarshi* it is a *muttaaddi* disease in which small white eruption appear on face nose and cheeks, on pressing a cheesy material expressed out from it.¹² Causes of these eruption is a *maddae-i-sadidiya* which comes towards skin surface due to *bukharat-i-badan*.¹¹

According to *Hakeem Ajmal Khan*, sometimes small pointed eruption appears on face, neck, chest, cheeks and nose. These eruptions are hard and red in color. When these eruptions become mature they excrete keel and some amount of pus.¹³

According to classical Unani literature, *Buthur* is a type of waram. The difference is only in size. *Buthur* are small awram.¹⁴ If any organ is unable to excrete out *fudlat* from skin or other organ disposed there *fudlat* towards this organ and organ is unable to dispose the waste, it results innutu or elevation in organ. If this elevation does not rupture the skin or mucous membrane then it is known as waram, and if the elevation is crushed it is known as *buthur*. *Buthur* which are on face and nose and are non itching, they are known as *labaniyya* or *samdiyya*.¹⁵

METHODOLOGY

The present study entitled "A study on prevalence of Acne Vulgaris and its impact on Quality of life in adolescents of Kendriya Vidyalaya's of Jalahalli area of Bangalore" was conducted by the department of Tahaffuzi wa Samaji Tib, National Institute of Unani Medicine, Bengaluru. The aims and objectives of the study were to assess the prevalence of acne vulgaris, its impact on the quality of life and to study socio-demographic factors, family history and lifestyle associated with the disease.

1. Criteria for selection of Subjects

(a) Inclusion criteria:

- Subjects of 12-18 year of age
- Subjects of both genders

(b) Exclusion criteria:

- Subjects of <12 years and >18 years of age
- Subject with known dermatological condition
- Those who are not willing to participate in the study

2. Study design

Present study was descriptive cross-sectional study to assess the prevalence of Acne Vulgaris and its impact on Quality of

life in adolescents of Kendriya Vidyalaya's of Jalahalli area of Bangalore.

3. Study Population

Study population comprised of school children of age group 12-18 years (adolescents) of selected schools of Jallahalli. Children of both sexes were included.

4. Duration of study

The study was conducted for a period of one year, from January 2017 to December 2017.

5. Sample size

Sample size was calculated as 200 using formula $n = Z^2_{\alpha/2} \times P \times (1-P) \div D \div E^2$ Where P is the prevalence or proportion of event of interest for study (P=70% taken from the previous studies), E is the precision or margin of error (E= 10% of P), $Z_{\alpha/2}$ is normal deviation at 5% level of confidence (=1.96) and D is the design effect (which is 1 for simple random sampling)

6. Ethical clearance

Before starting the study, a comprehensive protocol was prepared and put for obtaining clearance from the Institutional Ethics committee (IEC) of NIUM, Bengaluru. After getting ethical clearance with IEC No: NIUM/IEC/2015-16/019/TST/04 study was started.

7. Methods of collection of data

Data was collected from selected schools of Jallahalli using simple random sampling method. Respondents were enrolled in the study after taking written assent/consent from them. A pretested structured questionnaire consisting various questions and aspects regarding sociodemographic profile, acne vulgaris and the assessment of quality of life were administered to the respondents fulfilling inclusion criteria. Quality of life assessment data were obtained by using CADI, CDLQI/DLQI and Acne grading was calculated by using GAGS.

Socio-economic status: Socioeconomic status of the parents was calculated by using Kuppuswamy's socioeconomic status scale 2014. On the basis of that parents were graded in different socioeconomic classes as

upper class (I), upper middle class (II), lower middle class (III), upper lower class (IV) and lower class (V).

Measurement of the study variables

Age: the age of children was recorded from school register.

Sex: Gender of the included children was obtained from school record.

Language spoken: This information was gained to know whether the students require any interpreter or translated for the talk.

Assessment of Acne Vulgaris in school children; Acne was graded in to mild, moderate and sever based on GAGS (Global acne grading system) this system divides the face, chest and upper back into six areas (forehead, each cheeks, nose, chin and chest and upper back) and assign a factor to each area on the basis of size.

Table 3: The global acne grading system¹¹²⁾

Location	Factor
Forehead	2
Right cheek	2
Left cheek	2
Nose	1
Chin	1
Chest and upper back	3

Note: Each type of lesion is given a value depending on severity: no lesions = 0, comedones = 1, papules = 2, pustules = 3 and nodules = 4. The score for each area (Local score) is calculated using the formula: Local score = Factor × Grade (0-4). The global score is the sum of local scores, and acne severity was graded using the global score. A score of 1-18 is considered mild; 19-30, moderate; 31-38, severe; and >39, very severe

CDLQI is a general questionnaire to assess the quality of life. It consist of 10 questions about disease symptoms and feelings (question 1&2), Leisure (question 4,5 & 6), school or holidays (question 7), Personal relationships (question 3 &8), sleep (question 9) and treatment (question10).The scoring of each question is as; Very much = 3, Quite a lot = 2, Only a little = 1, Not at all = 0, Question unanswered = 0, Question 7: "Prevented school" =3.Its domain is from zero(without any effect on quality of life) to 30(extremely large effect on quality of life).The CDLQI was calculated by summing the score of

each question resulting in a maximum of 30 and a minimum of 0. The higher the score, the more quality of life is impaired.

Interpretation; 0-1=No effect on child's life, 2-6 = Small effect, 7-12 = Moderate effect 13-18 = Very large effect, 19-30 = extremely large effect.

DLQI consists of 10 questions about disease symptoms and feeling (question 1&2), daily activities (question 3&4), Leisure (question 5&6), work and school (question 7), Personal relationships (question 8&9), treatment (question 10).The scoring of each question is as; Very much = 3, Quite a lot = 2, Only a little = 1, Not at all = 0, Question unanswered = 0, Question 7: Question 7: "Prevented work or studying" =3.Its domain is from zero(without any effect on quality of life) to 30(extremely large effect on quality of life).The CDLQI was calculated by summing the score of each question resulting in a maximum of 30 and a minimum of 0. The higher the score, the more quality of life is impaired.

Interpretation; 0-1=No effect on patient's life, 2-5 = Small effect, 6-10 = Moderate effect 12-20 = Very large effect, 21-30 = extremely large effect.

CADI a questionnaire which was specific for acne and contains 5 questions. Each question is scored from 0-3 leading to

a total score of 0-15. The CADI score is calculated by summing the score of each question resulting in a possible maximum of 15 and minimum of 0. CADI score is graded as low (0-4), medium (5-9) and high (10-15).A higher score shows a very large impact on quality of life

Both CADI and CDLQI/DLQI questionnaire were copyright protected, hence prior permission was granted from the University and authors before their use.

CDLQI was administered to adolescents age less than 16 year of age, where as DLQI was administer to adolescent age 16 or above.

RESULT

A total number of 200 patients aged 11 to 18 years were taken in study among. Patients were divided into 4 groups in which maximum 56.5% were among patients between 15-16 years followed 32.5% of age group 13 to 14 years and 7% patients of age group 17-18 years. Out of total number of 200 patients, 46% of patients were male and 54% of patients were female. In this study, out of 200 adolescent 36% adolescent were dark and 64% were fair complexion. 69% were non vegetarian and 31% were vegetarian. (Table1).

Table 1: Association of demographic variables with Acne according to Respondents

Demographic variables	Acne vulgaris		Total (n=200)	P value
	YES	NO		
Age in years				
11-12	6(3.5%)	2(7.7%)	8(4%)	0.202
13-14	57(32.7%)	85(30.8%)	65(32.5%)	
15-16	101(58.1%)	12(46.1%)	113(56.5%)	
17-18	10(5.7%)	4(15.4%)	14(7%)	
Complexion				
Dark	55(31.6%)	17(65.4%)	72(36%)	0.001
Fair	119(68.4%)	9(34.6%)	128(64%)	
Type of Family				
Joint	13(7.5%)	6(23.1%)	19(9.5%)	0.029
Nuclear	161(92.5%)	20(76.9%)	181(90.5%)	
Socio Economic Status				
Upper Class	154(88.5%)	19(73.1%)	173(86.5%)	0.001
Upper Middle	17(9.78%)	5(19.2%)	22(11%)	
Lower Middle	2(1.15%)	2(7.7%)	4(2%)	
Upper Lower	1(0.5%)	0(0.0%)	1(0.5%)	
Food Habits				
Non Veg	120(68.9%)	18(69.2%)	138(69%)	1.000
Veg	54(31.1%)	8(30.8%)	62(31%)	
Gender				
Female	94 (54.0%)	11 (42.3%)	105 (52.5%)	0.2973
Male	80 (46.0%)	15 (57.7%)	95 (47.5%)	

Table 2: CADI distribution according to gender of Respondents

CADI	Gender		Total
	Female	Male	
Low	33(35.1%)	38(47.5%)	71(40.8%)
Medium	42(44.7%)	35(43.75%)	77(44.3%)
High	19(20.2%)	7(8.75%)	26(14.9%)
Total	94(100%)	80(100%)	174 (100%)

According to CADI scores of acne showed low effect in 40.8% of the patients, majority had medium effect in 44.3% of patients and high effect was seen on 14.9% of patients (Table2).

According to DLQI scores of acne showed no effect in 9.8% of the patients,

small effect in 13.2% of the patients, moderate effect in 22.9% of patients, very large effect in 20.7% of patients and extremely large effects on 32.8% of patients. (Table 3).

Table 3: CDLQI distribution according to of Respondents

CDLQI	Gender		Total
	Female	Male	
No Effect	7(7.4%)	10(12.5%)	17(9.8%)
Low effect	1(1.1%)	0(0%)	1(0.6%)
Small Effect	11(11.7%)	12(15.0%)	23(13.2%)
Moderate effect	20(21.3%)	20(25.0%)	40 (22.9%)
Very Large Effect	19(20.2%)	17(21.3%)	36(20.7%)
Extremely large effect	36(38.3%)	21(26.2%)	57(32.8%)
Total	94(100%)	80(100%)	174 (100%)

*P<0.001***, Significant, Fisher Exact Test

Table 4: CDLQI/DLQI distribution according to GAGS of respondents

CDLQI/DLQI	GAGS				Total
	Mild	Moderate	Severe	Very Severe	
No Effect	17(11.7%)	0(0%)	0(0%)	0(0%)	17(9.8%)
Low effect	1(0.6%)	0(0%)	0(0%)	0(0%)	1(0.6%)
Small Effect	23(15.5%)	0(0%)	0(0%)	0(0%)	23(13.2%)
Moderate effect	40(27.0%)	1(5.3%)	0(0%)	0(0%)	41(23.6%)
Very Large Effect	32(21.6%)	2(10.5%)	0(0%)	0(0%)	34(19.5%)
Extremely large effect	35(23.6%)	16(84.2%)	3(100%)	4(100%)	58(33.3%)
Total	148(100%)	19(100%)	3(100%)	4(100%)	174(100%)

*P<0.001***, Significant, fisher exact test

This table shows that there is close association in between the severity of acne and quality of life.

DISCUSSION

The overall prevalence of acne in this study was 87% and it was more common in females than males, confirming our results with previous findings that acne is common in adolescent females.¹⁶ However the prevalence of acne was reported to be lower in some studies.¹⁷ The difference in prevalence rates between these two groups of studies may reflect ethnic variation. Comparison of prevalence rates between studies is also hampered by the varied method of acne grading used by different studies and the wide range of diagnostic criteria used.

In present study maximum number of subjects 56.5% (113) were in the age group of 15-16 years, Our finding is in accordance with the finding of a study conducted by Jancovic *et al* which showed that acne prevalence is more at the age of 16 and 17 years.¹⁸ Balakrishnan *et al* also reported that acne is a chronic disease affecting 85% of the teenagers.¹⁹

Our study subjects comprised predominantly of females 52.5% (105) while remaining 47.5%(95) were males in the present study (table and figure no.2).Our finding are in accordance with the finding of previous studies conducted by Ismail *et al* in which the majority of the study population was constituted by females.²⁰ In one study conducted by Chinese in 2012 which reported that acne in adolescents was predominant in males and adult acne was common in females.²¹

In our study the vast majority of students had mild acne 85.1% (148) and 10.9% (19) had moderate acne, 1.7% (3) had severe and 2.3% (4) had very severe acne (table 2). A similar pattern was obtained in comparative studies previously conducted by Yahya *et al*. Study conducted by Kaduna *et al* and Hanisha *et al*¹⁶ in Malaysian adolescents, recorded 93.1% and 90.2% frequency of mild acne respectively. However, Tan *et al*²² obtained a near equal prevalence of moderate/severe acne (48.6%) and mild acne (51.4%) in Singaporean adolescents. In one hospital-based studies, Agheai *et al* found more moderate/severe grades of acne (84%) compared to mild

grades (16%), and so did Mallon *et al*²³. In the UK this is not unexpected, as persons with more severe diseases are likely to seek medical intervention, thus hospital-based studies are likely to yield more severe forms of acne compared to community-based ones such as ours.

The overall CADI score was 44.3% (77), indicating a mild degree of disability from acne. Similar values were obtained in some community-based studies¹⁶, while higher scores were obtained by Motley and Finlay²⁴ in the UK and Oakley²² in New Zealand, respectively. Several reasons may be adduced for the relatively higher CADI scores in the two latter studies, which were hospital-based: Firstly, hospital-based studies have a higher concentration of persons with more severe grades of acne compared to community-based surveys. Secondly, the ages of patients in hospital-based surveys are varied compared to the exclusively adolescent age of fore mentioned community-based studies. Another factor may be cultural and/or racial; the studies with higher CADI scores were conducted in Western societies.²⁴

Our study showed that the impact of acne on quality of life was proportional to acne severity. These results are in agreement with similar studies where both acne and severity are self reported.^{25, 23,26,27,28,16,29,30} It was observed that there was significant correlation between the CADI and GAGS ($p < 0.001$). Our finding is in accordance with the finding of previous studies conducted by Hanisha *et al*¹⁶ who recorded that the severity of acne correlate strongly with the effect of quality of life. But in some other studies the correlation between GAGS and CADI was weak as reported by Law *et al*³⁵.

In the present study it was observed that there was a moderate to extremely large effect based on CDLQI/DLQI score which is similar to study by Safizedeh H *et al*. who found that there was a moderate to very large influence on quality of life in patients with acne. Haritha *et al* also found moderate

to very large effect of acne in adolescents (table 3).

In present study it was observed that there was medium effect 44.3% (77) of Acne vulgaris on adolescents based on CADI score which indicate high psychosocial burden from acne. Similarly, Hanish *et al* reported that based on specific response of CADI of the patients, they felt aggressive, frustrated or embarrassed as a result of having acne.¹⁶

A study done in the psychiatry OPD of a medical institution in New Delhi found significantly higher psychiatric morbidity in patient with acne vulgaris. Similarly, in our study a significant correlation of GAGS score with CDLQI/DLQI ($p < 0.001$) and CADI ($p < 0.001$) was found. The result showed that acne has an impact on quality of life.³⁶

Study's Limitations

This study has a few limitations. First, the study was limited to one geographical location (Jalahalli) hence; the result of the study cannot be generalized to the entire city. Second issue is of over reporting, which is a well-recognized issue for self-report surveys as the participants tend to report in socially desirable ways. For example, the smoker may want to over-report non smoker to appear healthier. Third, it is a cross sectional study design which limits causality of relations. Further sample size was less compared with many of the other studies.

CONCLUSION

Thus, it may be concluded that evaluation of the quality of life in patients with acne is important as it help in the pharmacological as well as psychological treatment of these patients in a more effective and integrated way. Further Health education is needed in our secondary schools to ensure that adolescents understand their disease and to know what treatments are available and from whom they should seek advice. A Health professional should be aware that early acne

treatment can prevent progression of the disease and its complication.

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